

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Luminaire –  
Part 2-13: Particular requirements – Ground recessed luminaires**

**Luminaire –  
Partie 2-13: Règles particulières – Luminaires encastrés dans le sol**

[IEC 60598-2-13:2006](#)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**LUMINAIRES –**

**Part 2-13: Particular requirements –  
Ground recessed luminaires**

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**IEC 60598-2-13 edition 1.2 contains the first edition (2006-06) [documents 34D/856/FDIS and 34D/860/RVD], its amendment 1 (2011-12) [documents 34D/1009/CDV and 34D/1041/RVC] and its amendment 2 (2016-05) [documents 34D/1202/FDIS and 34D/1210/RVD].**

**In this Redline version, a vertical line in the margin shows where the technical content is modified by amendments 1 and 2. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.**

International Standard IEC 60598-2-13 has been prepared by subcommittee 34D: Luminaires, of IEC technical committee 34:Lamps and related equipment.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This publication is intended to be read in conjunction with IEC 60598-1: *Luminaires – Part 1: General requirements and tests*. It was established on the basis of the sixth edition of that standard.

Part 2 of IEC 60598 consists of the following parts<sup>1</sup> under the general title *Luminaires – Part 2: Particular requirements*:

- Part 2-1: Fixed general purpose luminaires
- Part 2-2: Recessed luminaires
- Part 2-3: Luminaires for road and street lighting
- Part 2-4: Portable general purpose luminaires
- Part 2-5: Floodlights
- Part 2-6: Luminaires with built-in transformers for filament lamps
- Part 2-7: Portable luminaires for garden use
- Part 2-8: Handlamps
- Part 2-9: Photo and film luminaires (non-professional)
- Part 2-10: Portable luminaires for children
- Part 2-11: Aquarium luminaires
- Part 2-13: Ground recessed luminaires
- Part 2-17: Luminaires for stage lighting, television and film studios (outdoor and indoor)
- Part 2-18: Luminaires for swimming pools and similar applications
- Part 2-19: Air-handling luminaires (safety requirements)
- Part 2-20: Lighting chains
- Part 2-22: Luminaires for emergency lighting
- Part 2-23: Extra low voltage lighting systems for filament lamps
- Part 2-24: Luminaires with limited surface temperatures
- Part 2-25: Luminaires for use in clinical areas of hospitals and health care buildings

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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<sup>1</sup> Other parts are under consideration.



## LUMINAIRES –

### Part 2-13: Particular requirements – Ground recessed luminaires

#### 13.1 Scope

This Part 2 of IEC 60598 specifies requirements for ground recessed luminaires incorporating electric light sources for operation from supply voltages up to 1 000 V, for indoor or outdoor use, e.g. in gardens, yards, carriageways, parking lots, cycleways, footways, pedestrian areas, swimming pools areas outside zones for SELV, nurseries and similar applications.

This part does not cover ground recessed luminaires for motorised roads and for airfields already specified in IEC 61827<sup>2</sup>.

##### 13.1.1 Normative references

The references of Section 0 of IEC 60598-1 apply.

#### 13.2 General test requirements

The provisions of Section 0 of IEC 60598-1 apply.

#### 13.3 Definitions

The definitions of Section 1 of IEC 60598-1 apply together with the following:

##### 13.3.1

##### **ground recessed luminaire**

luminaire suitable to be installed in the ground, having the supply connections and electrical components located below ground level

##### 13.3.2

##### **rated maximum surface temperature**

*T*

the highest temperature on the accessible outer surface, under normal operating conditions according to 13.12

#### 13.4 Classification

Luminaires shall be classified in accordance with Section 2 of IEC 60598-1.

#### 13.5 Marking

The provisions of Section 3 of IEC 60598-1 apply together with the requirements of 13.5.1 to 13.5.3

**13.5.1** Rated load in N, according to 13.6.1 (in the manufacturer's instructions).

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<sup>2</sup> IEC 61827: *Electrical installation and beaconing of aerodromes – Characteristics of inset and elevated luminaires used in aerodromes.*

**13.5.2** Rated maximum surface temperature  $T$  in °C;  $T$  marking to be given on the luminaire according to second column (B) of Table 3.1 of IEC 60598-1 and/or in the manufacturer's instructions and catalogues.

**13.5.3** Information, in the manufacturer's instructions, concerning the external connecting box, if necessary.

*Compliance is checked by inspection.*

## 13.6 Construction

The provisions of Section 4 of IEC 60598-1 apply together with the requirements of 13.6.1 to 13.6.5

NOTE More samples could be necessary to perform all the tests, some of them possibly being destroyed.

### 13.6.1 Resistance to static load

Luminaires shall withstand the minimum static load according to the manufacturer's instructions.

*Compliance is checked by the following test:*

*The sample is mounted as in normal use, in accordance with the manufacturer's instructions. ~~The test load, to be maintained with a tolerance of  $\pm 3\%$ , shall be applied to the top side of the luminaire by a cylindrical rubber punch having the following characteristics:~~*

- ~~— diameter = 50 mm, or luminaire diameter  $D$  (see Figure 1) if smaller than 50 mm;~~
- ~~— hardness "shore A" =  $65 \pm 5$ ;~~
- ~~— thickness = 50 mm~~

*The test load, to be maintained with a tolerance of  $\pm 3\%$ , shall be applied to the top side of the luminaire by a cylindrical steel punch equipped with a sheet of rubber in contact to the luminaire.*

*The punch shall have a diameter of 50 mm, or luminaire diameter  $D$  (see Figure 1) if smaller than 50 mm.*

*The thickness of the steel punch shall be 50 mm.*

*The rubber shall have the following characteristics:*

- hardness "shore A" (the hardness measured with the durometer type A) =  $65 \pm 5$ ;*
- thickness = 10 mm.*

*It shall be set in such a way that, during the test, the vertical axis is perpendicular and coincides with the geometrical centre of the translucent cover (see Figure 2).*

*The load shall then be applied uniformly by the rubber punch, at a rate not greater than 5 000 N/min. The maximum load shall be applied for 1 min.*

*After the test the sample shall comply with the conformity requirements of IEC 60598-1, Subclause 4.13.1 (i.e.: as applied following the mechanical impact test).*

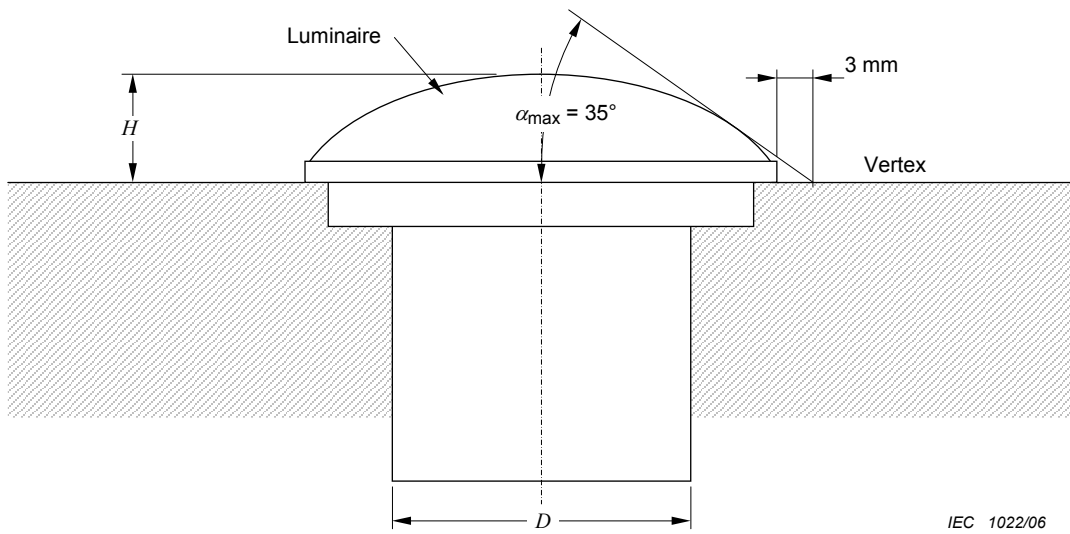
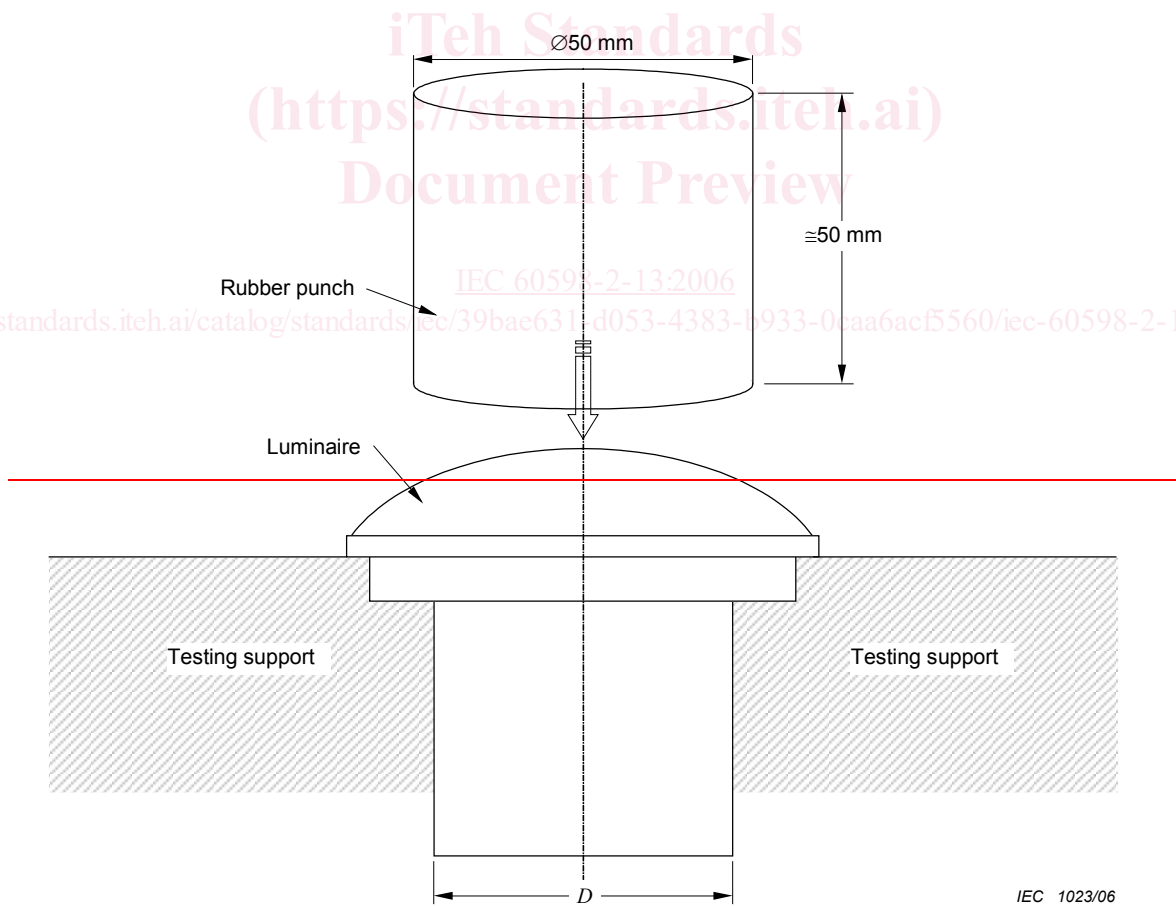
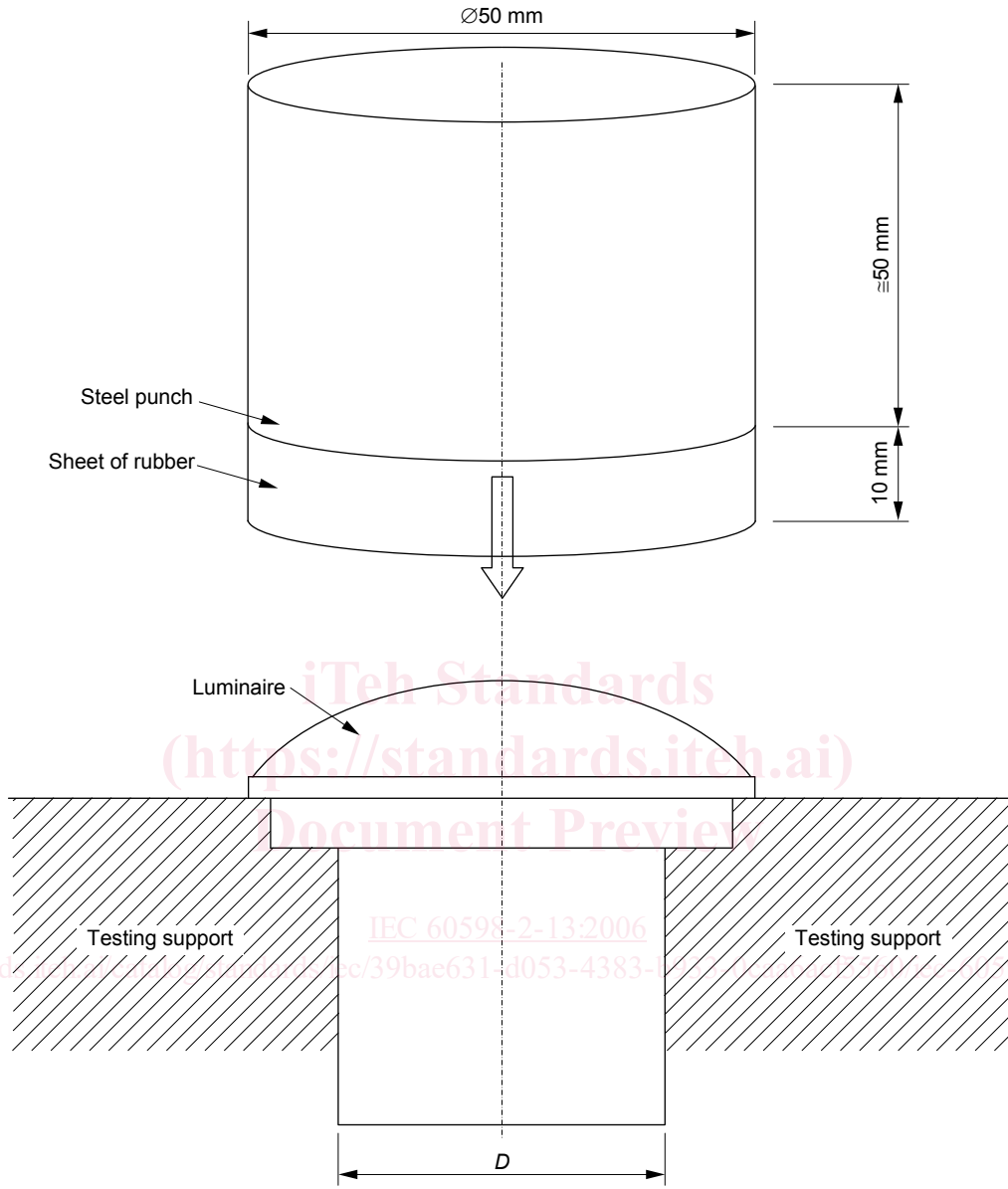


Figure 1 – Basic dimensions quoted in Annex A





IEC 2583/11

Figure 2 – Static load test apparatus

### 13.6.2 Resistance to torque and shear loads

Luminaires designed to be used in areas where motor vehicles may circulate, carriageways, parking areas, etc. (see items 3 and 4 in Table A.1) shall withstand the forces exerted by a turning, braking or accelerating tire.

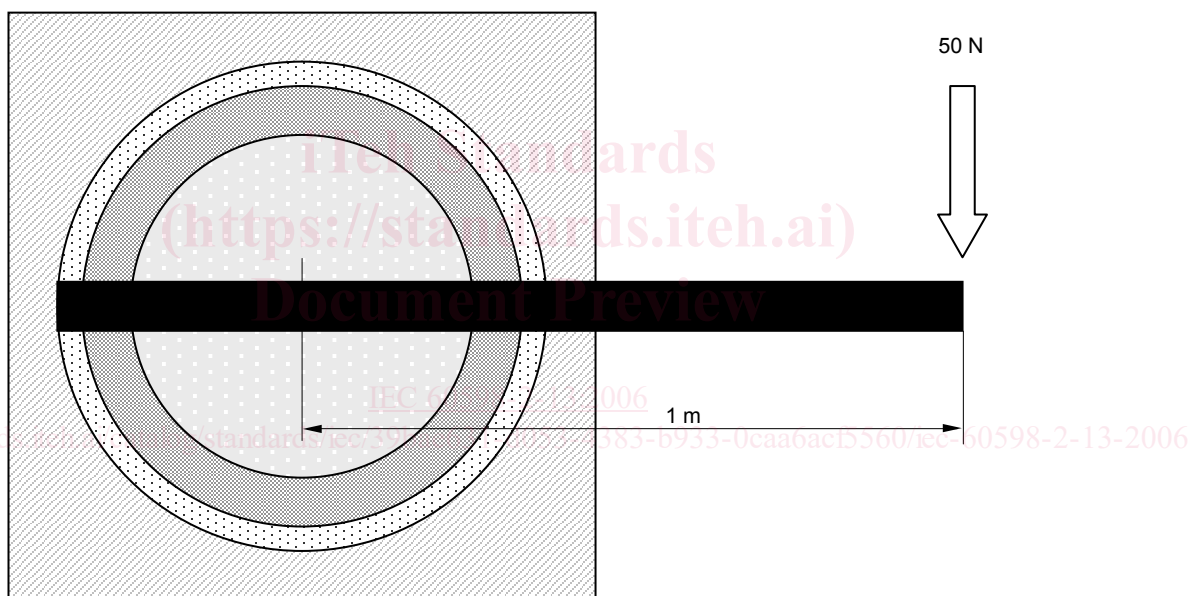
*Compliance is checked by the tests of 13.6.2.1 and 13.6.2.2*

#### 13.6.2.1 Torque test

Parts of luminaire that may be subjected to rotational force shall have adequate mechanical strength. The joints between these parts shall be subject to a 50 N torque force for one minute (see Figure 3). Each joint shall be tested separately.

*After the test, the sample shall comply with the conformity requirements of IEC 60598-1, Subclause 4.13.1 (i.e. as applied following mechanical impact test)*

NOTE The test is intended to check both the components fixing and the luminaire to ground fixing.



Push force applied to bar = 50 N/60 s (example)

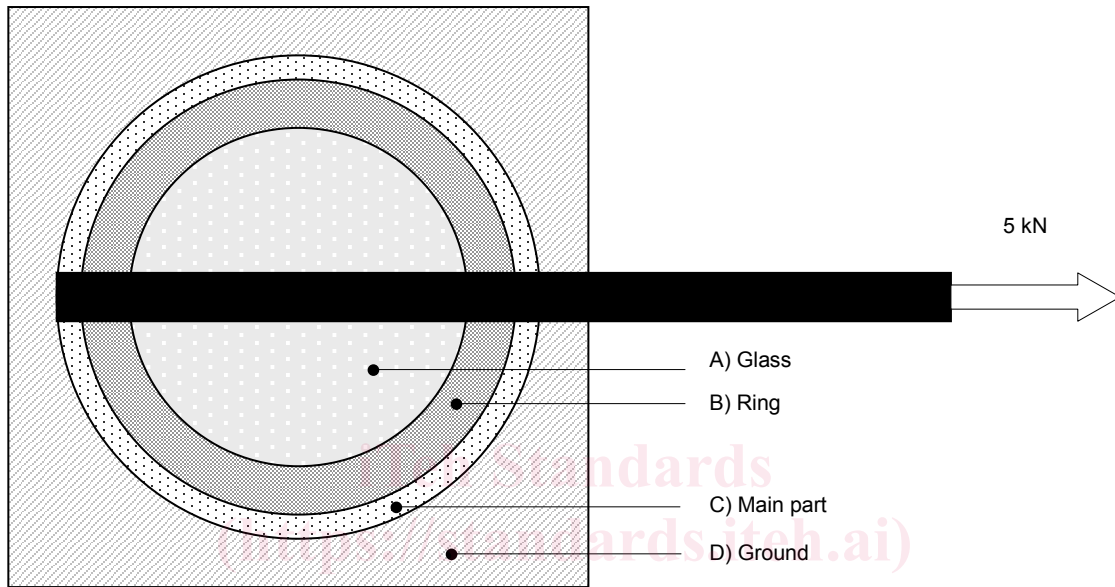
IEC 1024/06

**Figure 3 – Illustration of torque test**

**13.6.2.2 Shear load test**

With the same test arrangement of 13.6.2.1, a pull force of 5 kN shall be applied to the same parts progressively for not less than 5 s but not more than 10 s and released lengthwise to the end of the bar for 20 times (see Figure 4) in the direction of the carriage way centreline intended for the installation of the luminaire, if any.

*After the test the sample shall comply with the conformity requirements of IEC 60598-1, Subclause 4.13.1 (i.e. as applied following mechanical impact test).*



Pull force applied to bar = 5 kN/20 times

IEC 1025/06

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**Figure 4 – Illustration of shear load test**

**13.6.3 Resistance to thermal shock**

Glass covers shall be resistant to the effect of thermal shock.

*Compliance is checked by the following test:*

*The luminaire and glass cover shall be preconditioned by the thermal endurance test given in 13.12 of this standard.*

*The luminaire shall be positioned such that as far as possible its cover glass is horizontal and facing upwards. The luminaire is operated until the maximum glass cover temperature measured during thermal test is attained. The luminaire is then switched off and disconnected from the electrical supply. Immediately following the electrical disconnection, 1 litre of iced water (maximum 5°C) shall be poured from a height of approximately 1 m onto the glass cover. The time taken to pour the water shall not exceed 5 s.*

NOTE This test can result in violent shattering of glass. Appropriate safety precautions should be taken to protect persons performing this test and the surrounding environment. For example: wear protective clothing and face visor, erect screens around the test luminaire to protect surrounding area and test personnel, use a long handle flask to pour water from distance.

*Compliance is checked by visual inspection and the glass shall not be broken.*